

**Staff Summary
Method 2B Application**

Clean Energy

**Fresh Kills Landfill Gas (Staten Island, New York) to Liquefied Natural Gas
and Liquefied-to-Compressed Natural Gas Delivered in California
(Pathway Codes: CNG054, CNG055, and LNG035)**

Deemed Complete Date: September 22, 2015
Posted for Comments Date: November 20, 2015
Certified Date: December 1, 2015

Pathway Summary

Clean Energy Renewable Fuels, LLC (Clean Energy) has applied for two landfill-gas-to-biomethane fuel pathways. The landfill gas (LFG) for both pathways is extracted from the Fresh Kills Landfill in Staten Island, New York. The landfill and the LFG Recovery Facility both are owned and operated by the City of New York Department of Sanitation (DSNY). LCFS credit-rights for all biomethane from the Fresh Kills Landfill are received by EM Gas Marketing, LLC (EMGM) and biomethane delivery is tracked to Clean Energy liquefaction facility in Boron, California by EMGM. One pathway covers the liquefaction of the resulting biomethane at Boron liquefaction facility and the dispensing of the fuel as liquefied natural gas (LNG); the other pathway covers the liquefaction of the resulting biomethane at Clean Energy liquefaction facility and the subsequent vaporization and compression of the liquefied natural gas into compressed natural gas (L-CNG). All fueling stations covered by these pathways are located in California.

LFG from the Fresh Kills Landfill is cleaned up using grid electricity and buy back¹ natural gas from the pipeline system. The buy-back fossil natural gas is used in the compressor, thermal oxidizer, and flare pilot. The thermal oxidizer and flare are used to destroy LFG when the processing plant is not fully operational.

The pathway utilizes the CA-GREET1.8b default values for LFG recovery and L-CNG conversion. To determine combustion emissions from the consumed natural gas, the flare and the thermal oxidizer, the CA-GREET1.8b default values for natural gas combustion in a turbine were used. These emissions factors are more representative of operations at the Fresh Kills Landfill plant than are the emission factors for a compressor powered by a natural gas engine.

The biomethane from the Fresh Kills LFG processing plant is injected into the interstate pipeline system and equivalent amounts removed at Clean Energy liquefaction plant in Boron, California. The pipeline transport distance is 3,500

¹ Buy back gas: natural gas supplied to the pipeline grid is used in the Thermal Oxidizer

miles. As such, Clean Energy/EMGM will be obligated to retain records that unequivocally demonstrate that the credits earned under the pathways described in this Summary correspond directly with the volumes of biomethane produced at the Fresh Kills Landfill in Staten Island, New York.

Carbon Intensity of LNG and L-CNG Produced

As shown in table below, the applicant has calculated the CIs of its LNG and L-CNG pathways to be 29.28, 24.68, and 31.40 gCO₂e/MJ, respectively.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (gCO ₂ e/MJ)		
			Direct Emissions	Land Use or Other Indirect Effects	Total
LNG from LFG	LNG035	2B Application*: New York landfill gas to pipeline-quality biomethane; delivered via pipeline; liquefied to LNG in California	29.28	0	29.28
CNG from LFG	CNG055	2B Application*: New York landfill gas to pipeline-quality biomethane; delivered via pipeline; compressed to CNG in California	24.68	0	24.68
L-CNG from LFG	CNG054	2B Application*: New York landfill gas to pipeline-quality biomethane, delivered via pipeline, liquefied in California; re-gasified and compressed to L-CNG in California	31.40	0	31.40

* Specific Conditions Apply.

Operating Conditions

1. Actual pathway energy consumption values shall remain at or below the levels specified in Clean Energy application. These pathways were calculated using LFG production data (gas sales) covering May 2012 through August 2014 and LNG liquefaction and CNG compression data covering calendar years January 2013 and December 2014². The recovery and processing efficiency levels at the Fresh Kills Landfill in Staten Island, New York shall remain at or above the levels specified in the Clean Energy application. In addition, the liquefaction efficiency at the

² Two different time periods of data were originated from the two different companies, where confidential business information from one could not be revealed to the other.

Boron LNG plant shall remain at or above the levels specified in the application.

2. Because the biomethane supplied under this pathway is commingled with fossil natural gas both when it enters the interstate pipeline system and when it enters Clean Energy Boron liquefaction facility, Clean Energy and EMGM must maintain an accounting system that will enable it to demonstrate unequivocally at any time that every unit of biomethane-based transportation fuel sold and reported under the LCFS can be associated with an equal unit of biomethane produced at the Fresh Kills Landfill.
3. Clean Energy/EMGM must unequivocally demonstrate that the biomethane that Fresh Kills landfill supplies to the natural gas pipeline has been stripped of its renewable attributes (e.g. Fresh Kills landfill, owned by DSNY, is supplying fossil methane in its contracts with the pipeline company).
4. EMGM/Clean Energy shall provide signed statements from any party to whom it conveys the biomethane from Fresh Kills Landfill attesting under penalty of perjury under California law that all environmental attributes, including the right to generate credits under the LCFS, are exclusively reserved to EMGM/Clean Energy, and that no party will claim or has claimed credit for volumes reported in California's LCFS program under any other governmental program except the federal RFS.

Staff Analysis and Recommendations

Staff has reviewed the Clean Energy application for the production of L-CNG and LNG from LFG originating in Staten Island, New York. Staff has replicated, using the CA-GREET1.8b spreadsheet, the CI values calculated by Clean Energy (with the support of EMGM). EMGM and Clean Energy have provided documentation in support of the key components of its pathways: energy consumption at the New York LFG processing plant and the Clean Energy liquefaction plant. Clean Energy has also provided the volumes of LNG and CNG produced. Staff is satisfied that the energy consumption levels reported in Clean Energy (with support from EMGM) application accurately represent actual usage for the time period for which records were submitted, and that Clean Energy/EMGM are capable of maintaining CIs that are at or below those shown in the table above. Therefore, staff recommends that Clean Energy Method 2B application for LFG-to-LNG and LFG-to-L-CNG pathways be certified, subject to the operating conditions set forth in this staff summary.